

FACT SHEET FOR STATE WASTE DISCHARGE PERMIT ST-7396
NICHOLS BROTHERS BOAT BUILDERS, INC

TABLE OF CONTENTS

INTRODUCTION	3
BACKGROUND INFORMATION	4
DESCRIPTION OF THE FACILITY	4
History.....	4
Industrial Processes.....	4
Treatment Processes.....	5
Distribution System- Infiltration Basin.....	7
GROUND WATER	7
TIERED CONDITIONS ON USE OF THE INFILTRATION BASIN	8
surface WATER.....	8
Permit Status	9
SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT	9
WASTEWATER CHARACTERIZATION	10
SEPA COMPLIANCE.....	11
PROPOSED PERMIT LIMITATIONS.....	11
TECHNOLOGY-BASED EFFLUENT LIMITATIONS	12
Human Health	14
GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS	14
COMPARISON OF LIMITATIONS WITH THE existing PERMIT modified on December 16, 1998	15
MONITORING REQUIREMENTS.....	15
WASTEWATER MONITORING.....	16
SOIL MONITORING.....	16
GROUND WATER level MONITORING.....	16
OTHER PERMIT CONDITIONS	17
REPORTING AND RECORDKEEPING	17
OPERATIONS AND MAINTENANCE.....	17
SOLID WASTE PLAN.....	17
overflow discharge to holmes harbor and adjacent wetlands	17
in-water best management practices	17
SPILL PLAN	17
GROUND WATER QUALITY EVALUATION (HYDROGEOLOGIC STUDY).....	18
engineering report required for treatment system upgrade	18
compliance schedule-new design to meet water quality standards.....	18
Compliance schedule	18
GENERAL CONDITIONS	20
RECOMMENDATION FOR PERMIT ISSUANCE	20

REFERENCES FOR TEXT AND APPENDICES.....	21
Appendices.....	22
APPENDIX A—PUBLIC INVOLVEMENT INFORMATION.....	22
APPENDIX B—GLOSSARY	23
APPENDIX C--TECHNICAL CALCULATIONS	26
APPENDIX D--RESPONSE TO COMMENTS	27

INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. ST-7396. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastewater to waters of the state of Washington. This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the state include procedures for issuing permits (Chapter 173-216 WAC), and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A—*Public Involvement Information*.

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D—*Response to Comments*.

GENERAL INFORMATION	
Applicant	Nichols Brothers Boat Builders, Inc.
Facility Name and Address	Nichols Brothers Boat Builders, Inc. P. O. 580 Cameron Road Freeland, WA 98249
Type of Facility	Ship Construction and Repair
Type of Treatment	Settling, filtration, infiltration
Discharge Location	Ground water – adjacent to Holmes Harbor Latitude: 48° 01' 00" N Longitude: 122° 32' 20" W
Legal Description of Application Area	Section, township, range NW ¼ of Section 10, Township 29 N, Range 2 E
Contact at Facility	Bryan Nichols (360) 331-5500 ext. 314
Responsible Official	Kenneth Schoonover Superintendent Sr. Vice President P. O. Box 580, Freeland, WA 98249

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Nichols Brothers Boat Builders, Inc. (NBBBI) has been operating as a shipyard in Freeland, Washington, since 1964. Historic industrial uses of the property included a saw mill and machine shop which were active in the 1920's through the 1940's. A location map and facility schematic are given in Figures 1 and 2. The 20-acre facility is surrounded by a residential neighborhood. NBBBI employs up to 355 people, and the hours and number of shifts vary depending on the number and production rate of the vessels.

In 1999 NBBBI resurfaced approximately 27,000 square feet of the north end of the yard to provide for a smooth concrete base. At the end of the concrete base on the north end of the yard, a gutter was installed to catch the run-off and convey it to the catch basin. Rocks were placed into the end of the trough leading to the catch basin in order to allow a longer filtering opportunity for the drain off to settle some of the larger solids. The trough is cleaned out regularly to remove the deposited particulates.

NBBBI's fabrication and repair work is done inside several movable buildings unless the vessel is too large to be accommodated. The yard is reconfigured with every major new vessel fabricated. The work yard was reconfigured in 2002. Approximately 25,000 square feet of concrete was laid over the southwest corner of the yard. At that time, another gutter was installed from west to east across the center of the yard to capture a large portion of the drain off and slow down the flow into the catch basin. NBBBI added three 65' x 40' buildings and three 25' x 35' buildings over the past couple of years.

Recently, NBBBI purchased a Bobcat power sweeper/vacuum that is used to clean the yard daily, minimizing the solids available to drain into the infiltration basin.

The concrete pad that was poured over most of the yard was also used to accommodate the construction and assembly of the Empress of the North, a 3500-ton, 360-foot cruise vessel. A sectioned railway was constructed, which spanned over 600 feet from the edge of the yard down into the harbor. This railway was disassembled following the launch. The company is currently fabricating three catamarans, including the X-Craft, a \$60 million Navy prototype 265 feet long with a top speed of 69 mph. Nichols has launched 450 vessels in the past 40 years.

INDUSTRIAL PROCESSES

At the Freeland site, all aspects of boat and ship repair and construction are performed. The industrial processes involved include fabrication, pressure washing, abrasive blasting, and painting. In a typical year, NBBBI works on two to ten ships, primarily vessels of steel or aluminum and include high speed aluminum catamarans, tugs, barges, cruise ships, and an occasional fishing vessel.

In the construction process, ships, or parts of ships, are fabricated inside one of several buildings on-site. The assembly and finishing work is conducted either in one of the buildings or outside on the paved areas of the facility. Except where the vessel size is prohibitive, sandblasting, pressure washing, and painting of vessels are conducted under a moveable shed or one of the fabrication buildings which provides protection and containment during these operations.

According to the supplemental application, approximately 24 tons of abrasive material is used in a typical year. Sand blasting is propelling a metallic or nonmetallic grit by compressed air to forcibly impinge on the surface being cleaned. Metallic grit includes utility slag, copper slag, or aluminum. The constituents of abrasive blast vary somewhat, but in general their primary components with approximate percentages are: silicon dioxide 20-50 %, iron oxide 15-40 %, aluminum oxide 0-25 %, and calcium oxide 0-25 %. These four components comprise from 80 to 99% of the abrasive grit composition. Trace elements in these abrasive grits include: potassium oxide, sodium oxide, copper, titanium, and sulfur. Nonmetallic includes recycled glass of various sizes and sodium bicarbonate. Dryblasting is only used to prepare hulls for paints that require a new profile for paint adherence such as polyethylene. Spent sandblast grit is stored in a completely enclosed building, and the spent grit is disposed of on an as-needed basis by Industrial Services to be recycled.

At this time, NBBBI does not have a drydock, railway, or other similar structure to haul out vessels from the water. Instead, NBBBI operates a hydraulically driven track-tread mounted heavy mover, known as a "crawler," to move boats from the water, up a concrete ramp, and onto the NBBBI site. The crawler can carry up to 1500 tons and can be customized to accommodate most vessels. June 2003, however, Nichols Brothers constructed and placed an unpermitted 600-foot railway to launch the Empress of the North, a 3500-ton, 360-foot cruise ship. The railway was subsequently pulled. A portable railway is stored on Nichols Brothers property.

Three wastewater streams are generated from the work yard at NBBBI. These include vessel pressure wash water, intermittent process rinse waters (e.g. yard hose down, vessel rinsing), and stormwater. Domestic wastewater generated at NBBBI is conveyed separately to an existing onsite drainfield. There is no access to a municipal sanitary sewer system in the area.

TREATMENT PROCESSES

Wastewater Streams

Pressure wash wastewater: In 2002-2003, the supplemental application noted ten percent of the vessels required low pressure rinsing and three percent of paint is removed by sanding or scraping. Each washing event generated approximately zero to 900 gallons (2500 gallons reported in the supplemental application) of wastewater. Pressure wash water is typically the most contaminated waste stream generated from shipyards. It often contains high levels of suspended solids and total and dissolved metals (copper, lead, zinc, and chromium). NBBBI has not discharged pressure wash water to the infiltration basin since the issuance of the last discharge permit in 1998. Since then, NBBBI has collected and hauled all wastewater generated by pressure washing of hulls off-site to a licensed treatment and disposal facility. This management practice has been considered AKART by the Department. As this technology has been used for the last four years, it is available and reasonable and considered AKART. Discharge of the pressure wash wastewater to the stormwater treatment and subsurface infiltration system or to surface water is prohibited in the permit.

Rinse waters: Process rinse waters are generated from a variety of activities at the NBBBI facility, including yard cleaning, vessel hull wetting for pressure testing, deck and hull cleaning, and crawler rinse down. City water is used for all of these operations. The wastewaters generated from these operations are similar in quality to general stormwater runoff from the yard. Rinse waters are infiltrated to ground water through the stormwater collection, treatment and infiltration system.

Stormwater: Stormwater runoff is generated from the property as a result of incidental precipitation. Through their Stormwater Pollution Prevent Plan (SWPPP) and Best Management Practices (BMPs), NBBBI has instituted a series of controls to minimize the contamination of stormwater runoff from their industrial activity areas. Stormwater runoff from the paved areas of the yard is collected through a series of catch basins and collection trenches. All fabrication and painting of vessels is done on the paved or covered part of the yard. The area of the yard containing the treatment system is gravel or compact soil. The stormwater runoff from this area either infiltrates directly or is collected in the stormwater collection system. The collected stormwater enters the treatment and infiltration system.

Treatment System Design

Currently, the basic design of the treatment system includes a treatment vault, four 200-micron fabric filters, and an infiltration basin. A schematic drawing of the treatment system can be found in Figure 3. In the treatment vault grit and heavy solids are removed through sedimentation.

The vault is also equipped with baffles to contain oil in the event of a spill. Bag filters follow the treatment vault to remove filterable suspended solids prior to release into the infiltration basin where soils in the basin further treat the water through filtration and adsorption before it enters the ground water.

A more detailed description of the waste streams and treatment system can be found in the “Engineering Report: Pressure Wash Wastewater/Stormwater Management System, Nichols Brothers Boat Builders, Inc., Freeland, Washington” (Landau, 1997).

In the past NBBBI has experienced stormwater or marine water intrusion into the work yard and the treatment vault. This additional effluent can overload the treatment system and reduce the capacity of the cation-exchange sites in the infiltration basin. NBBBI has installed a pressurized cover for the vault that restricts flow from entering the vault during these tidal events. Consequently, NBBBI has not reported or monitored any marine water intrusions in the last five years. The Department concludes that NBBBI has demonstrated the ability to exclude marine waters from introduction into the treatment vault and system. Intrusion of marine tidal water into the treatment vault and stormwater treatment basin is prohibited as it has not been reported for the last five years and is AKART.

This permit requires upgrading the stormwater treatment facility to accommodate the 10-year, 24-hour storm event. Because this has been achieved for same source categories including other shipyards such as Pacific Fishermen, Hansen, Duwamish Shipyard, Fishing Vessel Owners Marine Ways, Puglia Engineering, and TODD Pacific, the Department has determined this to be AKART. This requirement will minimize pollutants discharging to Holmes Harbor and the adjacent wetlands.

DISTRIBUTION SYSTEM- INFILTRATION BASIN

The infiltration basin at NBBBI was designed as a “water quality infiltration basin” according to the specifications identified in the Stormwater Management Manual for the Puget Sound Basin (Ecology, 1992b). The design specifications for the infiltration basin are included in the approved engineering report entitled, “Engineering Report: Pressure Wash Wastewater/Stormwater Management System, Nichols Brothers Boat Builders, Inc., Freeland, Washington,” dated March 17, 1995, and amended April 18, 1995. The infiltration basin soil management plan was further modified October 15, 1998. After the wastewater is pretreated in the treatment vault and subsequent fabric filter, infiltration is designed to provide additional treatment through soil filtration and cationic exchange prior to the release to subsurface ground waters. Currently NBBBI has a maximum discharge of approximately 35,200 gallons per day and an average monthly discharge of 22,000 gallons per day. In the previous permit NBBBI was not required to monitor ground water following the treatment of the infiltration basin. An AKART analysis conducted by Hart Crowser (1997) for the shipyard industry cautions that performance of media filters may be impacted by varying concentrations of metals in the stormwater. The report states, “A filter which has adsorbed large quantities of metals from a stormwater with high metals concentrations at the beginning of a storm may desorb metals when washed by the cleaner stormwater at the end of the storm, decreasing the average removal efficiency of the media.” This permit requires monitoring of heavy metals, oil and grease, pH, total dissolved solids, chloride, infiltration rate and the soils within the basin to ensure the proper environment for cation exchange during infiltration of the wastewater. This is consistent with Chapter 7 of the *Stormwater Management Manual for Western Washington*, August 2001. This permit requires NBBBI to monitor the efficiency of the basin this permit cycle.

GROUND WATER

Originally, the infiltration basin at NBBBI was designed and constructed according to the specifications in the Department of Ecology’s Stormwater Manual. This includes providing a vertical distance of at least three feet from the base of the infiltration basin to the seasonal high ground water level. The photographs taken September 2003 during excavation for soil change-out show ponding of water at 24 inches during the dry season. This could either be the result of a mounding of the ground water table due to infiltration over time or perched water within the sediments of the infiltration basin above the water table. This permit has been modified to be consistent with the 2001 Stormwater Manual which recommends a vertical distance of at least 5 feet from the base of the infiltration basin to the seasonal high ground water level. Monitoring is required in the permit to determine the distance between the bottom of the infiltration basin and the top of the ground water table.

During permit application, testing was conducted to identify potential pollutants of concern. A test for Total Dissolved Solids exceeded ground water quality standards of 500 mg/L with a resultant value of 2400mg/L. This permit requires characterization of the effluent which will include sampling for Total Dissolved Solids.

Until recently, the basin was within 150 feet of the drinking water well for the restaurant directly south of the shipyard property. The restaurant is now pumping water from an upgradient well. Although this is upgradient from the basin the teabag effect related to tidal influence may occur. The infiltration basin is situated more than 100 feet from NBBBI’s domestic drain field. The

March 17, 1995, Engineering Report mentions ground water ranges between 0.5 and 2 feet below the pre-construction surface grade with a daily variation of approximately one to two inches, possibly due to tidal fluctuation. This infers connection with tidal surface waters. The 1995 Engineering Report also states, "The shallow gradient direction in this area is toward Holmes Harbor; this gradient direction will remain upon implementation of the infiltration system." This permit will require monitoring of the effluent following cation exchange treatment to insure compliance with water quality and technology based permit limits. If there is an exceedence of ground water quality standards the permit requires a hydrogeologic study to evaluate the ground water beneath the current infiltration basin or at a new location. This study should follow the guidance provided in WAC 173-200-080 and the *Implementation Guidance for the Ground water Quality Standards (Ecology, 1996)*.

TIERED CONDITIONS ON USE OF THE INFILTRATION BASIN

To characterize the effluent following treatment of the infiltration basin, monitoring following treatment will be required in order to determine whether ground water and surface water quality standards are met. If surface water quality standards are exceeded, an evaluation will be required to investigate whether the effluent has a hydrologic connection with the surface waters of the state. If groundwater standards are exceeded the permit requires a hydrogeologic study. Any discharges exceeding state water quality standards will follow the compliance schedule (Condition S.11) in this permit. The compliance schedule also includes a timeline to upgrade the treatment system to meet the 10-year 24-hour design storm.

SURFACE WATER

Due to the proximity of the shipyard to Holmes Harbor and the hydrogeologic conditions between the infiltration basin and the beach, there is a potential to pollute the marine waters of Holmes Harbor. The 1995 Engineering Report states: "The shallow ground water aquifer in the direct vicinity of the infiltration basin is potentially impacted by salt water flow into the adjacent wetland areas..." Sometimes during high tide events (June and November, 2004) the basin is surrounded on the Harbor side by tidal surface water. While the effluent at the point of compliance meets ground water standards for copper, lead, chromium, and zinc, it may not meet surface water quality standards for Class A marine waters. An example is copper which has a ground water standard of 100ug/L and a chronic surface water standard of 3.1ug/L. Surface water quality standards for heavy metals are more stringent as they are based on the effects related to aquatic organisms which are more sensitive to copper than humans. According to the Department of Fish and Wildlife, the near shore environment of Holmes Harbor habitat affecting marine organisms includes: Eelgrass, Pacific Herring Spawning Habitat, Pacific Sand Lance Spawning Habitat, Juvenile Salmonid Migration Corridors, and Intertidal Beach Productivity (HPA, December 3, 2002).

EPA has stated on several occasions that discharges to ground water may fall under the requirements of the Clean Water Act where the ground water is hydrologically connected to nearby surface waters. Court decisions, including *McClellan Ecological Seepage Situation v. Weinberger*, *Washington Wilderness Coalition v. Hecla Mining Co.*, and *Friends of the Coast Fork v. Turner*, also support the position that discharges to ground water that effect (are hydrologically connected to) surface waters may require an NPDES permit. Marine surface water quality standards for chronic conditions would be (in ug/L): chromium-50, copper-3.1,

lead-8.1, and zinc-81.0. These are far lower than the current ground water and performance based effluent limits (see below). Should NBBBI decide to continue infiltration of effluent at the current location they will be required to show compliance with both ground water and surface water quality standards. If there is an exceedence of surface water quality standards NBBBI will be required to conduct a hydrologic connectivity test demonstrating the relationship between ground water and marine surface water in the vicinity of the NBBBI shipyard. If the ground water standards are exceeded a hydrogeologic study is required to evaluate potential impacts to ground water. Additionally, seepage from the banks of the infiltration basin into the adjacent wetlands was observed during a field review. In order to protect surface water quality the engineering report will include a barrier prohibiting seeps from the infiltration basin excluding precipitation events exceeding the 10-year 24-hour design storm.

Pacific Herring spawn along the eelgrass adjacent to this facility and Taylor (1964) notes the eggs are very sticky and sometimes the eggs adhere in great masses to the eelgrass beds and can be dislodged by the turbulence of heavy weather, leading to high mortality. During the launch of the empress there was damage done to the eelgrass beds due to propeller motion from the tugs necessary to dislodge the ship from the mud. (Pritchard 1944 et al) found Pacific Herring to be one of the major fodder animals providing food for Chinook and Coho salmon. WAC 220-110-271 specifically protects migrating juvenile salmonids, surf smelt, and Pacific Herring spawning beds in these areas with timing restrictions for construction. Any activities which may be required for this permit must follow all other permits and regulations.

This State Waste Discharge Permit does not authorize discharges to surface waters of the state.

PERMIT STATUS

The previous permit for this facility was issued on December 8, 1997, subsequently appealed and first modified December 23, 1997. Following a lengthy negotiation period, it was further modified on December 16, 1998, and the appeal was settled with a stipulated agreement.

An application for permit renewal was submitted to the Department on December 16, 1998, and accepted by the Department on June 22, 1999.

On August 16, 1999, NBBBI received a letter stating that because the Department did not issue a permit within the required timeframe, the application was the temporary permit. This letter is normally sent to new permittees that do not already have an issued permit. On March 28, 2002, the Department conducted an inspection at the site. The inspectors mentioned that the wrong letter was sent, and the Department's assumption was that the current permit was still in effect. Regardless, in the permit application it states clearly that any former permit is, by extension, part of the application. This would result in the previous permit remaining in effect until a new permit is written.

A new application for a Wastewater Discharge Permit for Discharge of Industrial Wastewater to Ground was submitted December 12, 2003.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

A compliance inspection with sampling was conducted on March 28, 2002. New construction was underway for a ship fabrication building which helps to keep particulates from stormwater

entrainment. Some concerns noted were an oily sheen sitting in the infiltration basin and mobile fueling units without proper containment. A grab sample of the water in the pond indicated some treatment within the infiltration basin for copper lead and chromium. The pH value was 9 which is outside the permit limit range of 6.5 to 8.5 standard units.

The facility last received an inspection on June 16, 2003. This was the day of the launch of the Empress. The inspection found a discharge flowing from the treatment vault that was not sampled and had not been reported, both required under the permit. Records related to the operation and maintenance of the infiltration basin had not been kept as required under the permit.

On June 4, 2003, a joint Notice of Penalty and Order was signed involving Gordon White, Program Manager for Shorelands and Environmental Assistance Program (DOE), and Phillip Bakke, Director of Planning and Community Development (Island County). A penalty was issued to NBBBI for \$47,000 for violating RCW 90.58.140, 90.58.030, 90.58.210 (2), 90.58.020, WAC 173.27.040 and WAC 220.110.271, when constructing a launch system along the shoreline of Holmes Harbor. In addition, the Army Corps of Engineers and the Washington State Department of Fish and Wildlife issued a stop work order to NBBBI on May 27, 2003. At or around the same time of the construction of the railway system, an email was sent to the Department from NBBBI stating within a supplemental application that NBBBI does not have a drydock, railway, or other structure to make launches and haul out easy. A penalty was issued from the Department for violation of WAC 172.216.070 (6) and Condition G1 of the previous permit. NBBBI has paid the penalty without admitting any wrongdoing.

NBBBI has been monitoring and reporting discharges to the infiltration basin in compliance with the permit. The infiltration basin was changed out in September, 2003. The estimated cumulative loading for copper exceeded the estimated capacity for cation exchange by 2%. NBBBI is required to maintain the basin with adequate cation exchange for copper and other metals. This permit will require NBBBI to maintain a minimum cation exchange capacity of 5meq/100grams of soil to insure cation availability to adsorb copper ions.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the permit application and in discharge monitoring reports. The metal concentrations below were reported in the application received December 12, 2003. The proposed wastewater discharge is characterized for the following parameters: Total Recoverable* (TR) - Copper, Zinc, Lead, Chromium, and Oil and Grease. One sample of Total Dissolved Solids resulted in a value of 2500mg/L. State Standards are exceeded above 500mg/L. This permit requires NBBBI to sample for Total Dissolved Solids during this permit cycle. Chloride will also be monitored in the effluent since it may utilize cation exchange sites and cause plugging of the infiltration pores.

As was described in the Industrial Processes section, sandblasting grit, paint, and paint chips are the sources for most of the heavy metal concentrations. Oil and grease originate from spills or spots on the yard which are not sufficiently cleaned up prior to stormwater or rinse water exposure.

Table 1: Wastewater Characterization Average Concentrations

Parameter (TR*)	Concentration
Copper	80 µg/L
Zinc	332 µg/L
Lead	10.5 µg/L
Chromium	4.1 µg/L
Oil and Grease	5 mg/L

SEPA COMPLIANCE

This permit includes a compliance schedule for design and construction of a stormwater system that will treat the 10-year, 24-hour rainfall event. Prior to construction, all necessary SEPA documents must be signed. The Department has been informed that construction of a railway is expected sometime in 2007. The Department expects to comment on this project during the SEPA process.

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the State. NBBBI shall continue to implement standards approved by the Department. The minimum requirements to demonstrate compliance with the AKART standard were determined in the engineering report (“Engineering Report: Pressure Wash Wastewater/Stormwater Management System, Nichols Brothers Boat Builders, Inc., Freeland, Washington,” dated March 17, 1995, and amended April 18, 1995), in conformance with the Stormwater Management Manual for the Puget Sound Basin (Ecology, 1992b), and in conformance with *Guidelines for the Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, May 1993. In addition, the infiltration basin must meet conditions included in the letter dated October 9, 1998, from Foster Wheeler Environmental Corporation regarding “Infiltration Basin Soil Management Plan Stormwater/Wastewater Treatment System Nichols Brothers Boat Builders, Inc., Freeland, Washington. NBBBI will be required to implement further designs approved by the Department. The permit also includes limitations on the quantity and quality of the wastewater applied to the infiltration basin that have been determined to protect the quality of ground water. Water quality-based limitations are based upon compliance with the ground water quality standards (Chapter 173-200 WAC).

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment (AKART) of discharges to waters of the state (WAC 173-216-110).

The revised code of Washington (RCW) includes AKART language in 90.48.520 and 90.54.020. RCW 90.48.520 states:

In order to improve water quality by controlling toxicants in wastewater, the Department of Ecology shall in issuing and renewing state and federal wastewater discharge permits, review the applicant's operations and incorporate permit conditions which require all known, available, and reasonable methods to control toxicants in the applicant's wastewater. Such conditions may include, but are not limited to: (1) Limits on the discharge of specific chemicals, and (2) limits on the overall toxicity of the effluent. The toxicity of the effluent shall be determined by techniques such as chronic or acute bioassays. Such conditions shall be required regardless of the quality of receiving water and regardless of the minimum water quality standards. In no event shall the discharge of toxicants be allowed that would violate any water quality standard, including toxicant standards, sediment criteria, and dilution zone criteria.

90.54.020 includes: 3) The quality of the natural environment shall be protected and, where possible, enhanced as follows:

(b) Waters of the state shall be of high quality. Regardless of the quality of the waters of the state, all wastes and other materials and substances proposed for entry into said waters shall be provided with all known, available, and reasonable methods of treatment prior to entry. Notwithstanding that standards of quality established for the waters of the state would not be violated, wastes and other materials and substances shall not be allowed to enter such waters which will reduce the existing quality thereof, except in those situations where it is clear that overriding considerations of the public interest will be served.

WAC 173-216-110 (1) states: Any permit issued by the department shall specify conditions necessary to prevent and control waste discharges into the waters of the state, including the following, whenever applicable: (a) All known, available, and reasonable methods of prevention, control, and treatment.

The following permit limitations are necessary to satisfy the requirement for AKART:

Nichols Brothers Boat Builders have been collecting and hauling pressure wash wastewater since the issuance of the last permit in 1998. Since this is available and reasonable technology, there is a provision in this permit which prohibits pressure wash wastewater from discharge. This wastewater will not be allowed to discharge into the infiltration basin.

To ensure minimizing oil and grease discharges, the Department will establish an oil and grease effluent limitation of 5 mg/L. This level of control is AKART.

A prohibition of discharges of wastewater from cooking, dish washing, showers, hydrotesting of piping system and portable steaming and hauling off-site is determined to be AKART.

Recycling of solvents on-site or off-site disposal is AKART. Zero discharge from maintenance shops is determined to be AKART.

Bilge and ballast water hauling off-site for treatment is determined to be AKART.

All in-water work is prohibited. Since this permit does not include NPDES coverage for shipyards, NBBBI shall not perform any in-water work which has the potential to pollute surface waters.

Upgrading the stormwater treatment facility to accommodate the 10-year, 24-hour storm event is AKART.

STORMWATER AND RINSE WATER

Stormwater

Technology-based effluent standards for the discharge of metals in stormwater have not been established by the Department on an industry-wide basis. However, the Department has reviewed preferable alternatives for the treatment and discharge of stormwater from shipyard facilities. The preferred alternatives include on-site infiltration, discharge to the sanitary sewer, and enhanced filtration with discharge to surface water. All of these alternatives should be preceded by pretreatment of the stormwater. NBBBI pre-treats its stormwater by settling and filtration prior to discharging to a cationic exchange infiltration basin.

The technology-based limitations for copper and zinc in stormwater in this permit were derived from the historic performance for these pollutants at NBBBI after the application of Best Management Practices (BMPs). These performance-based limits are considered technology-based limitations.

The final effluent standards for stormwater are based on the more stringent of the ground water quality standards and historic performance based standards. Performance-based standards were determined from the record of history of monitoring data (Table 1 - Appendix C) and summarized in Table 2 below.

Table 2: Technology-Based Standards for Stormwater

Parameter	Value in µg/L
Oil and Grease	5 mg/L
Total Chromium	20
Total Copper	140
Total Lead	30
Total Zinc	620

For performance-based limits, the daily maximum effluent limitations were derived from the 95th percentile of the normal distribution of the data. This procedure is consistent with processes outlined in the Department's *Permit Writer's Manual* (Ecology, 2002) and the Technical Support Document for Water Quality-based Toxics Control published by the Office of Water U.S. EPA.

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The performance-based limits will be used during this permit cycle in addition to monitoring in evaluating contaminant values prior to reaching ground water.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the ground water quality standards. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

WAC 173-200-030, Antidegradation policy is as follows:

Existing and future beneficial uses shall be maintained and protected and degradation of ground water quality that would interfere with or become injurious to beneficial uses shall not be allowed.

Whenever ground waters are of a higher quality than the criteria assigned for said waters, the existing water quality shall be protected, and contaminants that will reduce the existing quality thereof shall not be allowed to enter such waters, except in those instances where it can be demonstrated to the department's satisfaction that:

An overriding consideration of the public interest will be served; and all contaminants proposed for entry into said ground waters shall be provided with all known, available, and reasonable methods of prevention, control, and treatment prior to entry.

Applicable ground water criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge are listed in Table 3 below:

Table 3: Ground water Quality Criteria

Parameter	Value
Total Chromium	50 µg/L
Total Copper	1000 µg/L
Total Lead	50 µg/L
Total Zinc	5000 µg/L

Total Chloride	250 mg/L
Total Dissolved Solids	500 mg/L
pH	6.5 to 8.5 standard units

*COMPARISON OF LIMITATIONS WITH THE EXISTING PERMIT MODIFIED ON
DECEMBER 16, 1998*

Table 4: Comparison of Previous and Proposed Limits

Parameter	Existing Limits	Proposed Limits	Basis
Total Chromium	50 µg/L	20.0 µg/L	Technology
Total Copper	600 µg/L	140 µg/L	Technology
Total Lead	50 µg/L	30 µg/L	Technology
Total Zinc	2400 µg/L	620 µg/L	Technology
Total Dissolved Solids	NA	Meet ground water standards by 5/1/07	Technology Water Quality
Chloride	NA	Meet ground water standards by 5/1/07	Water Quality
pH	6.5 to 8.5 NTU	6.5 to 8.5 NTU	Water Quality
Oil & Grease	10 mg/L	5 mg/L	Technology

Proposed limits for chromium, copper, lead and zinc are lower because these values are based on the ability of NBBBI to meet lower limits over the last permit cycle. The last permit did not include limits for Total Dissolved Solids or Chloride, but these parameters have now been identified as potential sources of pollution and must meet ground water quality standards. This permit includes monitoring following cationic treatment to determine whether water quality standards are met at that point. NBBBI may also conduct an approved hydrogeologic study and install ground water monitoring wells to meet the standards at the property boundary.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

This permit requires the Permittee to monitor the waste water outfalls on a twice per month schedule consistent with Hansen, Everett Shipyard Duwamish Shipyard, Fishing Vessel Owners Marine Ways, Puglia Engineering, and TODD Pacific. Monitoring shall be done following settling and filtration treatment and after cationic treatment.

The effluent limitations established in this permit require the effluent quality to meet or exceed the ground water quality standards following final treatment through infiltration. NBBBI is prohibited from discharging pressure wash wastewater.

WASTEWATER MONITORING

The monitoring schedule is detailed in the proposed permit under Condition S2.A, B, C, D and E. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

Under Special Condition S2 A and B of this permit, NBBBI is required to monitor the efficiency of the infiltration basin. A sampling apparatus will be constructed by installing a series of underdrain collectors (lateral) to intercept treated water after it has passed through the infiltration bed. The quality of water will then be evaluated before and after treatment with respect to the constituents of concern. If the apparatus collects representative samples for one year that are in compliance with the state surface and ground water quality standards, then a hydrologic connectivity test to evaluate connection to surface water and a hydrogeologic investigation to evaluate ground water quality will not be required. A compliance schedule to construct treatment facilities to meet the 10-year 24-hour design storm will still be required.

If the discharge monitoring records or the hydrogeologic investigation reveal a potential threat to the beneficial uses of surface or ground water, the Department will require the Permittee to meet AKART, surface and ground water quality standards under the Compliance Schedule in Condition S11.

SOIL MONITORING

Monitoring and management of the soil in the infiltration basin is essential to assure success of wastewater treatment and disposal at NBBBI. The key physical and chemical soil characteristics for wastewater treatment in the NBBBI system are copper, zinc, lead, chromium, chloride, total dissolved solids, the infiltration rate, cation exchange capacity (CEC), and pH. The soil monitoring program is required as permit condition S2. C to assess the conformance to these specifications over time and should be consistent with Chapter 7 in the *Stormwater Management Manual for Western Washington*, August 2001.

GROUND WATER LEVEL MONITORING

The design of the infiltration basin must include a vertical distance of at least five feet from the base of the infiltration basin to the seasonal high ground water level. This is required in Chapter 7, SSC-5 of the *Stormwater Management of Western Washington Manual*, 2001. To insure compliance with this design NBBBI must determine and monitor the depth to the ground water table below the infiltration basin and compare the elevation of the ground water level at an upgradient and down gradient location from the infiltration basin. This will show the elevation and gradient of the ground water table as it moves beneath the infiltration basin. This is necessary to assure the five foot separation from the base of the basin to the water table. A puddle was photographed during the last soil change out 24 inches below the treatment soils in the infiltration basin during the dry season. This may be the result of ground water mounding under the basin or perched water within the sediments of the infiltration basin above the water table. The permit requires monitoring on a quarterly basis to evaluate the ground water level during the various seasons. This is required in permit Condition S2. C.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions in this permit are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-216-110).

OPERATIONS AND MAINTENANCE

The proposed permit contains Conditions S4 and S5 as authorized under Chapter 173-240-150 WAC and Chapter 173-216-110 WAC. They are included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste including paint chips, sandblast grit, sludge from solvent still, oil slick socks from trenches and vault, waste cans, etc.. This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state and submit it to the Department. The plan must also be submitted to the local solid waste permitting agency for approval.

OVERFLOW DISCHARGE TO HOLMES HARBOR AND ADJACENT WETLANDS

Currently NBBBI is authorized to discharge to surface water during infrequent overflows of the treatment vault and the infiltration basin under NPDES stormwater permit number SO3-003161. Additional monitoring and reporting requirements are included for these discharges under Conditions S6 of the permit.

Since NBBBI has not reported and monitored for any discharges related to overflows within the last five years the Department concludes that it is unlikely to occur and requires NBBBI to design the new treatment system or upgrade the current system to prohibit overflows except when exceeding the 10-year 24-hour design storm. This is AKART as it has been achieved for the last five years at this facility.

IN-WATER BEST MANAGEMENT PRACTICES

In-water BMP's were deleted as no discharges associated with in-water work are authorized under this permit. In-water refers to sanding, pressure washing and painting done on a vessel over state waters.

SPILL PLAN

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

GROUND WATER QUALITY EVALUATION (HYDROGEOLOGIC STUDY)

If the results from Tier 1 show an exceedence of ground water standards then in accordance with WAC 173-200-080, the permit requires the Permittee to prepare and submit a hydrogeologic study for Departmental approval. This is required under Condition S10. of the permit. The hydrogeologic study will be based on soil and hydrogeologic characteristics and be capable of assessing impacts on ground water. The study will be prepared using "WAC 173-200-080 and Ground water Implementation Guidance, Chapter 4.0 Hydrogeologic Study." Within the guidance note specifically Section 4.2.2.5, Surface Water. The Permittee shall evaluate the impacts of its activities on ground water quality by completing: a scope of work for a ground water quality evaluation study, and a report of study results and ongoing monitoring consistent with permit Condition S3 and S10. In order to insure compliance with the anti-degradation standard, ambient ground water quality should be measured so a comparison between facility effluent and ambient ground water quality can be assessed. If it is determined that NBBBI exceeds ground water quality standards an AKART study will be required and the conditions under EAC 173-200-050 (3)(b)(vi) shall be satisfied.

ENGINEERING REPORT REQUIRED FOR TREATMENT SYSTEM UPGRADE

The permittee shall design the wastewater treatment system to meet AKART or water quality standards whichever is most stringent. The new design shall meet the requirement for the Stormwater Manual for Western Washington, 2001, except for the design storm which will be the 10-year 24-hour. The engineered design shall not contribute flow or seeps to Holmes Harbor or the adjacent wetlands except when precipitation exceeds the 10-year 24-hour design storm. No later than May, 1 2006 but may be earlier based on the Compliance schedule in S.11 below, two (2) copies of an approvable engineering report shall be prepared by the Permittee in accordance with WAC 173-240 and submitted to the Department for review and approval.

COMPLIANCE SCHEDULE-NEW DESIGN TO MEET WATER QUALITY STANDARDS

COMPLIANCE SCHEDULE

NBBBI must be in compliance with AKART, surface water and ground water quality standards, whichever are applicable, by May 1, 2007. In order to design the new wastewater treatment system that will meet all surface and ground water quality standards, shall not discharge to surface water and that will meet the 10-year, 24-hour design storm, the Permittee shall implement the following Compliance Schedule:

TIER 1

Construct an appropriate barrier to prevent run-on of tidal marine water into the shipyard and in the stormwater collection system.	September 15, 2004
Submit plan for lateral under-drain collectors	August 30, 2004
Install lateral underdrain collectors	September 30, 2004

Monitor effluent for one year-2/month

September 30, 2005

- (a) If representative samples cannot be obtained due to marine water intrusion or demonstration of surface water presence, NBBBI shall submit an engineering plan in conformance of Condition S.8 with the following schedule:

Submit Final Engineering Report	July 30, 2005
Begin Construction	March 30, 2006
Complete Construction	June 30, 2006

- (b) If the effluent meets surface water and ground water standards, continue monitoring for compliance of standards and implement Tier 4.
- (c) If effluent does not meet surface water standards but meets ground water standards, implement Tiers 2 and 4.
- (d) If effluent meets surface water standards but not ground water standards, implement Tiers 3 and 4.
- (e) If effluent does not meet surface and ground water standards, implement Tiers 2, 3 and 4.

TIER 2

If the effluent does not meet surface water quality standards, NBBBI must perform a Hydrologic Connectivity Test to evaluate whether there is a connection between the effluent flowing into ground water and surface or tidal waters. The compliance schedule is based on the first violation of surface water quality standards and is as follows:

Submit testing plan for approval	Within one month of violation
Complete test	Within three months of approval

- a) If there is a hydrologic connection between the infiltration basin effluent and either marine tidal waters or adjacent wetland waters NBBBI shall submit a receiving water quality study by January 15, 2006 in addition to a completed Shoreline Permit and SEPA Decision, and submit an NPDES permit application by July 1, 2006 and complete Tier 4. This permit does not authorize discharges to surface waters.
- b) If there is no hydrologic connection between the infiltration basin effluent and surface waters of the state, NBBBI shall complete Tier 3, if applicable, and Tier 4.

TIER 3

If the effluent does not meet ground water quality standards, NBBBI must perform a Hydrogeologic Study to evaluate potential effluent impacts on ground water. The compliance schedule is based on the first violation of surface water quality standards and is as follows:

Hydrogeologic Study-scope of work due	Within one month of violation
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Study Results Report

Within one year of approval

TIER 4

Design and construct the new treatment facility per Condition S8. above with the following schedule :

Submit Final Engineering Report and construction specifications based upon shipyard expansions plan May 1, 2006

Revise and modify SWPPP& other required plans May 1, 2007

Begin Construction of new stormwater treatment system and diffuser outfall or upgradient infiltration system June 15th, 2007

Complete Construction of new stormwater treatment system and diffuser outfall or upgradient infiltration system September 15, 2007.

Construction of the wastewater facility shall conform to an approved "Engineering Stormwater Collection and Treatment System Design." Nichols Brothers Boat Builders shall submit to the Department for approval a revised engineering report for any significant change in the treatment technology.

Currently NBBBI is collecting all stormwater from their parking lot and has installed a bioswale.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 and G8 relate to permit renewal and transfer. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the State of Washington. The Department proposes that the permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

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- Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. Field Techniques for Measuring Wetland Soil Parameters, Soil Science Society of America Journal, Vol. 53, No.3.
- Hansen, J., Rose, J., Jenkins, R., Gerow, K. and Bergman, H., 1999. Chinook Salmon (Oncorhynchus tshawytscha) and Rainbow Trout (Oncorhynchus mykiss) Exposed to Copper: Neurophysiological and Histological Effects on the Olfactory System, Environmental Toxicology and Chemistry, Vol. 18, No. 9. pp. 1979-1991.
- Hart Crowser, May 7, 1997. Final Report Shipyard AKART Analysis for Treatment of Stormwater, Maritime Environmental Coalition, Seattle, WA J-4699
- Pritchard, 1944. Food of spring and coho salmon in British Columbia. Fish. Res. Board. Can. Bull. 65: 23 p.
- Taylor, 1964. Life history and present status of British Columbia herring stocks. Fish. Res. Board Can. Bull. 143:81 p.
- Washington State Department of Ecology, 2001. Stormwater Management Manual for Western Washington, Ecology Publication # 99-11 through 99-15.
- Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.
- Washington State Department of Ecology.
- Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)
- Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)
- Washington State Department of Ecology, 1996. Implementation Guidance for the Groundwater Quality Standards, Ecology Publication # 96-02.
- Washington State University, November, 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

APPENDICES

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on (date) and (date) in (name of publication) to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on (date) in (name of publication) to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 – 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 425-649-7201, or by writing to the address listed above.

This permit was written by Donna Ortiz de Anaya.

APPENDIX B—GLOSSARY

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring--Uninterrupted, unless otherwise noted in the permit.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)--A calculated value five times the MDL (method detection level).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

APPENDIX D--RESPONSE TO COMMENTS